3. Japanese Patent Application Laid-Open No. 2-210315

(1) page 2, lower-left column, line 17

As shown in Fig. 1, a main construction of a focus detection device according to the invention includes a picture taking lens 11, a divided aperture mask 12 for dividing light flux from the picture taking lens 11 into a plurality of light fluxes, a plurality of color filters 13 corresponding to respective apertures, a color filter B14 arranged regularly one after another by each pixel, a CCD area sensor 15 for performing photoelectric conversion corresponding to each color filter B14, a calculating means 16 for discriminating a state of focusing (front focus/rear focus) based on the output of the CCD area sensor 15 and for outputting a direction of the picture taking lens 11 to be moved based on the state of focusing, and a driving means 17 for driving the picture taking lens 11 in the direction in accordance with an instruction from the calculating means 16.

An outline of an effect of this device is that a light flux passed through the picture taking lens 11 is divided into a predetermined number by the divided aperture mask 12, the divided fluxes pass trough the color filters A13 corresponding to respective masks, and are projected on the CCD area sensor 15 corresponding to color information of the aforementioned color filters A13 via color filters B14 arranged respective pixels.

Thus, the area sensor 15 can separately detect each flux passed through each mask of the divided aperture mask 12. Then, the calculating means 16, for example, detects positional relation between images g′ and g″ corresponding

to the light fluxes d and e, respectively, divided by the divided aperture mask 12 based on output signals from the area sensor 15 as shown in aforementioned Fig. 2. Moreover, according to the positional relation, whether it corresponds to Fig. 2 (b) or (c), the calculating means 16 discriminates the current state of the picture taking lens 11 whether the lens position is front focus or rear focus, calculates the moving direction of the picture taking lens 11, and outputs the control signal of the aforementioned moving direction to the driving means 17 for driving the picture taking lens 11.

Then, a focus detection device according to an embodiment of the invention based on the aforementioned concept will be explained. The focus detection device is applied to an automatic focusing device. As shown in Fig. 3, the construction of the device includes a picture taking lens 11, a divided aperture mask 12 which divide incident light flux into three, color filters A13 having three primary colors of red, green and blue (R, G, B) corresponding to the divided apertures, color filters B14 disposed on a CCD area sensor 15 corresponding to each pixel of the CCD, a direction detecting means 22 for calculating a moving direction of the lens based on output of the area sensor, band-pass filters 23 composed of a plurality of band-pass filters for dividing frequency of the output of the area sensor 15, a peak detector 24 for finding a focus by detecting a peak of each divided frequency, a controller 25 for controlling a motor 26 based on the moving direction signal of the picture taking lens 11 form the direction detecting means 22 and on/off signals from the peak detector 24, and the aforementioned motor 26

for driving the picture taking lens.